42. The peptide or polypeptide of claim 40 wherein the diseased cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma cells.

43. The peptide or polypeptide of claim 42, wherein the diseased cell is a leukemia cell.

44. The peptide or polypeptide of claim 43, wherein the leukemia cell is an acute myeloid leukemia cell.

45. The peptide or polypeptide of claim 37, wherein the selective and/or specific binding of the peptide or polypeptide to the ligand of the second cell is determined primarily by a first hypervariable region.

46. The peptide or polypeptide of claim 45, wherein the first hypervariable region is a CDR3 region having an amino acid sequence selected from the group consisting of SEQ ID NOs: 8-24.

47. The peptide or polypeptide of claim 46 wherein the first hypervariable region is a CDR3 region having an amino acid sequence selected from the group consisting of SEQ ID NOs: 8-24, and wherein the binding selectivity or specificity is secondarily influenced by a second hypervariable region, by a third hypervariable region, and/or by one or more of the upstream or downstream region flanking the first, the second and the third hypervariable regions, respectively.

48. A ligand that is expressed by the second cell and that is capable of being bound by the peptide or polypeptide of claim 37.

49. A molecule that recognizes and binds the ligand of claim 48.

50. A nucleic acid molecule encoding the peptide or polypeptide according to any one of claims 1, 31, 34, or 37.

51. The nucleic acid molecule of claim 50, wherein the nucleic acid is DNA.

52. The peptide or polypeptide of claim 37 wherein the first and second states of the first cell are the same, and wherein the first cell is derived from a cell line.

53. The peptide or polypeptide of claim 52, wherein the cell line is selected from the group consisting of Jurkat, Molt-4, HS-602, U937, TF-1, THP-1, KG-1, ML-2, and HUT-78.

54. A method for identifying a targeting molecule, which binds to unknown immuno-cross-reactive binding sites on first and second cells, comprising

performing one or more biopanning on a first target cell that, in a second state but not in a first state, substantially exposes or displays a binding site comprising at least one unknown ligand, thereby producing a first population of recognition molecules;

performing subsequent biopanning and/or selection steps, commencing with the first population of recognition molecules of step (a), that are performed on a second cell that displays a binding site comprising at least one unknown ligand having immuno-cross-reactivity to the unknown ligand of the first cell so as to produce a second population of recognition molecules;

amplification and purification of the second population of recognition molecules of step (b); and

construction from the recognition sites of the purified recognition molecules of step (c) peptides or polypeptides that comprise targeting molecules that are selective and/or specific for unknown ligands on the second cell.

55. The method of claim 54, wherein the first cell is a normal cell and wherein the first state is a non-activated state and the second state is an activated, excited, modified, changed, or disturbed state.

56. The method of claim 54 wherein the second cell is a diseased cell.

57. The method of claim 56, wherein the diseased cell is a cancer cell.

58. The method of claim 56, wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma cells.

59. The method of claim 58, wherein the cell is a leukemia cell.

60. The method of claim 59, wherein the leukemia cell is an acute myeloid leukemia cell.

61. The pharmaceutical composition comprising one of the peptide or polypeptide of claim 1 or claim 37, in association with or attached to, coupled to, combined to, linked to, or fused to a pharmaceutical agent.

62. The pharmaceutical composition of claim 61, wherein the composition has activity against a diseased cell.

63. The composition of claim 62 wherein the diseased cell is a cancer cell.

64. The composition of claim 62, wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma.

65. The composition of claim 64 wherein the cell is a leukemia cell.

66. The composition of claim 65, wherein the leukemia cell is an acute myeloid leukemia cell.

67. The peptide or polypeptide of claim 1 or claim 37, optionally in association with or attached, coupled, combined, linked or fused to a pharmaceutical agent, for use as a medicament.

68. The peptide or polypeptide of claim 67 wherein the medicament has activity against a diseased cell.

69. The peptide or polypeptide of claim 68 wherein the diseased cell is a cancer cell.

70. The peptide or polypeptide of claim 68, wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma cells.

71. The peptide or polypeptide of claim 70 wherein the cell is a leukemia cell.

72. The peptide or polypeptide of claim 71, wherein the leukemia cell is an acute myeloid leukemia cell.

73. The peptide or polypeptide of claim 1 or claim 37, wherein the peptide or polypeptide is utilized for preparing a composition for use in inhibiting the growth of a diseased or cancer cell.

74. The peptide or polypeptide of claim 73, wherein the cell is a leukemia cell.

75. The peptide or polypeptide of claim 74 wherein the leukemia cell is an acute myeloid leukemia cell.

76. A method of inhibiting the growth of a cancer cell comprising administering a composition comprising the peptide or polypeptide of claim 1 or claim 37, said composition comprising at least one compound having a pharmaceutical ligand selective and/or specific for the cancer cell.

77. A composition comprising at least one peptide of claim 1 or claim 37, in association with, or attached, coupled, combined, linked, or fused to a pharmaceutical agent in a pharmaceutically effective amount and, optionally, a pharmaceutically effective carrier.

78. The composition of claim 77 wherein the peptide or polypeptide and the pharmaceutical agent are linked via a linker compound.

79. The composition of claim 78, wherein the linker compound is selected from the group consisting of a dicarboxylic acid, a maleimido hydrazide, PDPH, a carboxylic acid hydrazide, and a small peptide.

80. The composition of claim 79, wherein the small peptide is selected from a group consisting of AU1, AU5, BTag, c-myc, FLAG, Glu-Glu, HA, His6, HSV, HTTPHH, IRS, KT3, Protein C, S•Tag®, T7, V5, VSV-G, and KAK-Tag.

81. The peptide or polypeptide according to any one of claims 1, 31, 34 and 37 wherein the tag is selected from a group consisting of: AU1, AU5, BTag, c-myc, FLAG, Glu-Glu, HA, His6, HSV, HTTPHH, IRS, KT3, Protein C, S•Tag®, T7, V5, VSV-G, and KAK-Tag.

82. The composition of claim 77, wherein the pharmaceutical agent is selected from the group consisting of radioisotope, toxin, oligonucleotide, recombinant protein, antibody fragment, and anti-cancer agent.

83. 83, The composition of claim 82 wherein the radioisotope is selected from a group consisting of indium, ^{111}indium, ^{113}indium, ^{99m}rhenium, ^{105}rhenium, ^{101}rhenium, ^{99m}technetium, ^{121m}tellurium, ^{122m}tellurium, ^{125m}telluriunm ^{165}thulium, ^{167}thulium ^{168}thulium ^{123}iodine, ^{126}iodine, ^{131}iodine, ^{133}iodine, ^{81m}krypton, ^{33}xenon, ^{90}yttrium, ^{213}bismuth, ^{77}bromine, ^{18}fluorine, ^{95}ruthenium, ^{97}ruthenium, ^{103}ruthenium, ^{105}ruthenium, ^{107}mercury, ^{203}mercury, ^{67}gallium and ^{68}gallium.

84. The composition of claim 82, wherein the toxin is selected from the group consisting of gelonin, Pseudomonas exotoxin (PE), PE40, PE38, diptheria toxin, ricin, and modifications and derivatives thereof.

85. The composition of claim 82, wherein the anti-cancer agent is selected from the group consisting of doxorubicin, morpholino-doxorubicin (MDOX), adriamycin, cis-platinum, taxol, calicheamicin, vincristine, cytarabine (Ara-C), cyclophosphazdde, prednisone, daunorubicin, idarubicin, fludarabine, chlorambucil, interferon alpha, hydroxyurea, temozolomide, thalidomide, bleomycin, and derivatives thereof.

86. A method of inhibiting the growth of a cell which comprises contacting the cell with an amount of the peptide or polypeptide of claim 1 or claim 37.

87. The method of claim 86 wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma.

88. The method of claim 87, wherein the cell is a leukemia cell.

89. The method of claim 88, wherein the leukemia cell is an acute myeloid leukemia cell.

90. A pharmaceutical composition comprising at least one peptide of claim 1 or claim 37 attached, coupled, combined, linked, or fused to an imaging agent, wherein said composition is used in the diagnostic localization and imaging of a tumor.

91. A method of treating a patient suffering from a disease or cancer, which comprises administering to the patient an amount of the peptide or polypeptide of claim 1 or claim 37 effective to treat the disease or cancer.

92. The method of claim 91 wherein the disease or cancer is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma.

93. The method of claim 92 wherein the disease is a leukemia.

94. The method of claim 93, wherein the leukemia is an acute myeloid leukemia.

95. The peptide or polypeptide of claim 1 or claim 37 wherein the Fv specifically or selectively binds to acute myeloid leukemia (AML) cells.

96. A ligand presented on AML cells bound by the peptide or polypeptide of claim 95.

97. A peptide or polypeptide that binds the ligand of claim 96.

98. A diagnostic kit for in vitro analysis of treatment efficacy before, during, or after treatment, comprising the peptide or polypeptide of claim 1 or claim 37 attached, coupled, combined, linked or fused to an indicative marker molecule.

99. The kit of claim 98 wherein the indicative marker molecule is a fluorescent marker.

100. The kit of claim 99, wherein the fluorescent marker is selected from the group consisting of fluorescein, rhodamine, phycoerythrin, and modifications and conjugates thereof.

101. The kit of claim 98, wherein the kit is used for diagnosis of a disease or cancer.

102. The peptide or polypeptide of claim 1 or claim 37, wherein the construct is an Ig polypeptide.

103. A method for producing the peptide or polypeptide of claim 102, wherein the Ig polypeptide is expressed as a recombinant polypeptide and is produced in a eukaryotic cell system.

104. The method of claim 103 wherein the eukaryotic system is a mammalian cell system.

105. The peptide or polypeptide of claim 102, wherein the Ig polypeptide is an IgG polypeptide.

106. The peptide or polypeptide of claim 105, wherein the IgG polypeptide comprises a CDR3, CDR2 and a CDR1 region having SEQ ID NOs:8, 115 and 114, respectively.

107. The IgG polypeptide of claim 106, wherein the CDR3, CDR2 and CDR1 regions are of the heavy chain.

108. The IgG polypeptide of claim 106 wherein the CDR3, CDR2 and CDR1 regions are of the light chain.

109. The IgG polypeptide of claim 102, wherein the IgG has a heavy chain comprising SEQ ID NO:26 and a light chain comprising SEQ ID NO:27 or chains having at least 90% amino acid similarity therewith.

110. A method for producing the peptide or polypeptide of claim 1 or claim 37 wherein the peptide or polypeptide is produced in a prokaryotic cell system or in a eukaryotic cell system.

111. The method of claim 110, wherein the prokaryotic system comprises *E. coli*, said *E. coli* comprising an expression vector and the eukaryotic system is a mammalian cell system.

112. The method of claim 111, wherein the expression vector of the prokaryotic system comprises a promoter selected from the group consisting of *osmB*, deo, β-lac-U5, λP_L, SRα5, and CMV.

113. A peptide or polypeptide that comprises a binding motif which comprises an amino acid sequence of R_1-X Phe Pro-R_2 wherein R_1 and R_2 each sequence comprises 0-15 amino acid residues, and wherein X is either Arg, Gly, or Lys.

114. The peptide or polypeptide of any of claims 2, 34, or 46, wherein the CDR3 comprises the amino acid sequence of R_1-X Phe Pro-R_2, wherein R_1 and R_2 each comprises 0- 15 amino acid residues, and wherein X is either Arg, Gly, or Lys.

115. The peptide or polypeptide of claim 1 or claim 37, wherein said peptide or polypeptide includes at least one non-naturally occurring modification.

116. The peptide or polypeptide of claim 115, wherein said non-naturally occurring modification renders the peptide or polypeptide more immunogenic or more stable.

117. The peptide or polypeptide of claim 116, wherein said at least one modification is selected from the group consisting of peptoid modification, semipeptoid modification, cyclic peptide modification, N-terminus modification, C terminus modification, peptide bond modification, backbone modification, and residue modification.

118. The peptide or polypeptide of any of claims 1, 31, 34, 37 or 67, for *ex vivo* purging of autologous bone marrow to remove abnormal cells.

119. A method of production of a targeting agent comprising the following steps:

isolating and selecting one or more targeting molecules comprising a primary recognition site by a biopanning procedure directly on a target cell or by a biopanning procedure indirectly on a first target cell in a second but not in a

first state and subsequently by a biopanning procedure directly on a second target cell to produce one or more said targeting molecules;

amplification, purification and identification of the one or more targeting molecules; and

construction of a targeting agent from the one or more targeting molecules or wherein the targeting agent can be a peptide, polypeptide, antibody or antibody fragment, or a multimer thereof.

120. The method of claim 119 wherein the targeting agent is coupled, attached, combined, linked, fused to, or in association with a pharmaceutical agent.

121. The method of claims 119 and 120 wherein the targeting agent is an anti-disease or anti-cancer agent.

122. The method of claim 120 wherein the pharmaceutical agent is selected from the group consisting of radioisotope, toxin, oligonucleotide, recombinant protein, antibody fragment, and anti-cancer agent.

123. The method of claim 122 wherein the radioisotope is selected from a group consisting of ^{111}indium, ^{113}indium, ^{99m}rhenium, ^{105}rhenium, ^{101}rhenium, ^{99m}technetium, ^{121m}tellurium, ^{122m}tellurium, ^{125m}telluriunm ^{165}thulium, ^{167}thulium ^{168}thulium ^{123}iodine, ^{126}iodine, ^{131}iodine, ^{133}iodine, ^{81m}krypton, ^{33}xenon, ^{90}yttrium, ^{213}bismuth, ^{77}bromine, ^{18}fluorine, ^{95}ruthenium, ^{97}ruthenium, ^{103}ruthenium, ^{105}ruthenium, ^{107}mercury, ^{203}mercury, ^{67}gallium and ^{68}gallium.

124. The method of claim 122 wherein the toxin is selected from the group consisting of gelonin, *Pseudomonas exotoxin* (PE), PE40, PE38, diptheria, ricin, and modifications and derivatives thereof.

125. The method of claim 122 wherein the anti-cancer agent is selected from the group vincristine, cytarabine, (Ara-C), cyclophosphamide, prednisone, daunorubicin, idarubicin, fludarabine, chlorambucil, interferon alpha, hydroxyurea, temozolomide, thalidomide, bleomycin, and derivatives thereof.

126. A peptide or polypeptide having the formula or structure:

A – X - B

wherein X is a hypervariable CDR3 region of 3 to 30 amino acids; and A and B can each be amino acid chains from 1 to 1000 amino acids in length wherein A is the amino end and B is the carboxy end.

127. The peptide, of claim 126 wherein A is 150-250 amino acid residues and wherein B is 350-500 amino acid residues.

128. The peptide of claim 126 wherein the CDR3 region is 5-13 amino acid residues.

129. The peptide or polypeptide of claim 126 wherein X is an amino acid sequence selected from the group consisting of SEQ ID NOs:8-24.

130. The peptide or polypeptide of claim 127 which is part of a larger or full antibody or a multimer.

131. A dimeric molecule comprising two peptides or polypeptides one of which is the peptide or polypeptide of claim 126.

132. A dimeric molecule comprising two peptides or polypeptides of claim 126 which are identical.

133. The dimeric molecule of claim 131 or claim 132 wherein X is an amino acid sequence selected from the group consisting of SEQ ID NOs:8-24.

134. A nucleic acid molecule encoding the peptide or polypeptide of claim 126 or the dimeric molecule of claim 130.

135. The method of claim 104, wherein the mammalian cell system comprises the SRα5 promoter.

136. The method of claim 104, wherein the mammalian cell system comprises the CMV promoter.

137. A peptide or polypeptide comprising an Fv molecule, a construct thereof, a fragment of either, or a construct of a fragment having enhanced binding characteristics so as to bind selectively and/or specifically to a target cell in favor of other cells, wherein the binding selectivity or specificity is primarily determined by a first hypervariable region, wherein the first hypervariable region is a CDR3 region comprising an amino acid sequence selected from the group consisting of SEQ ID Nos 8 or 20, and wherein the Fv is a scFv or a dsFv, and optionally having one or more tags.

138. The peptide or polypeptide of claim 137, wherein the binding selectivity or specificity is secondarily influenced by a second hypervariable region, by a third hypervariable region, and/or by one or more of the upstream or downstream region flanking the first, the second and/or the third hypervariable regions.

139. The peptide or polypeptide of claim 137 wherein the peptide or polypeptide is a scFv having SEQ ID NO: 25 in which the first hypervariable region is a CDR3 region which is identical to SEQ ID NO: 8.

140. The peptide or polypeptide of claim 137 wherein the peptide or polypeptide is a scFv having SEQ ID NO: 203 in which the first hypervariable region is a CDR3 region which is identical to SEQ ID NO: 20.

141. The peptide or polypeptide of claim 137 wherein the scFv molecule comprises a straight or branched chain spacer of 20 or fewer amino acid residues.

142. The peptide or polypeptide of claim 141 wherein the spacer comprises SEQ ID NO: 123 or SEQ ID NO: 124.

143. The peptide or polypeptide of claim 137 wherein the target cell is an activated, excited, modified, changed, disturbed, abnormal, or diseased cell.

144. The peptide or polypeptide of claim 143, wherein the diseased cell is a cancer cell.

145. The peptide or polypeptide of claim 143 wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma cells.

146. The peptide or polypeptide of claim 145 wherein the cell is a leukemia or myeloma cell.

147. The peptide or polypeptide of claim 145 wherein the leukemia or myeloma cell is a B-cell malignancy.

148. The peptide or polypeptide of claim 146, wherein the leukemia cell is an acute myeloid leukemia cell or a B-cell malignancy.

149. The peptide or polypeptide of claim 137 further comprising a cassette of consecutive amino acids having an amino acid sequence selected from the group consisting of SEQ ID NOs:30-113, or having at least 90% amino acid similarity therewith, or fragment thereof, wherein the cassette or fragment provides a framework into which is built, inserted, attached coupled, combined, or fused a CDR3 region having an amino acid sequence selected from the group consisting of SEQ ID NO:8 or 20.

150. The peptide or polypeptide of claim 149 wherein the cassette has an amino acid sequence selected from the group consisting of SEQ ID NOs:30-32,33, 37-39,41, 43, 45, 46, 48, 51, 54, 57, 59-68, 70, 71, 76-85, 87, 89-92, 94, 97, 99, 103, 106, 112, and 113, or having at least 90% amino acid similarity therewith.

151. The peptide or polypeptide of claim 149 wherein the cassette has the amino acid sequence of SEQ ID NO: 61, or has at least 90% amino acid similarity therewith.

152. The peptide or polypeptide of claim 151, wherein the cassette has the amino acid sequence of SEQ ID NO: 61, or has at least 90% amino acid similarity therewith.

153. The peptide or polypeptide of claim 151, wherein the seven carboxy-terminal amino acid residues of SEQ ID NO: 61 are replaced by the seven amino acid residues of SEQ ID NO: 122.

154. The peptide or polypeptide of claim 138, wherein the second and third hypervariable regions are a CDR2 and a CDR1 hypervariable region, respectively.

155. The peptide or polypeptide of claim 137, wherein the CDR3 region has the amino acid sequence SEQ ID NO: 8.

156. The peptide or polypeptide of claim 137, wherein the CDR3 region has the amino acid sequence SEQ ID NO: 20.

157. The peptide or polypeptide of claim 154, wherein the CDR2 and CDR1 regions have the amino acid sequences SEQ ID NO: 115 and SEQ ID NO: 114, respectively.

158. The peptide or polypeptide of claim 139, wherein the second and third hypervariable regions are a CDR2 and CDR1 hypervariable region respectively and wherein the CDR3, CDR2 and CDR1 regions have the amino acid sequences SEQ ID NOs: 8, 115 and 114, respectively.

159. The peptide or polypeptide of claim 139, wherein the second and third hypervariable regions are a CDR2 and CDR1 hypervariable region respectively and wherein the CDR3, CDR2 and CDR1 regions have the amino acid sequences SEQ ID NOs: 20, 115 and 114, respectively.

160. The peptide or polypeptide of claim 138, wherein the upstream region flanking the CDR3 region has the amino acid sequence of SEQ ID NO: 117, and wherein the downstream region flanking the CDR3 region has the amino acid sequence of SEQ ID NO: 116.

161. The peptide or polypeptide of claim 138, wherein the second hypervariable region is a CDR2 hypervariable region and wherein the upstream region

flanking the CDR2 region has the amino acid sequence of SEQ ID NO: 119, and wherein the downstream region flanking the CDR2 region has the amino acid sequence of SEQ ID NO: 118.

162. The peptide or polypeptide of claim 138 wherein the third hypervariable region is a CDR1 hypervariable region and wherein the upstream region flanking the CDRl region has the amino acid sequence of SEQ ID NO: 121, and wherein the downstream region flanking the CDR1 region has the amino acid sequence of SEQ ID NO: 120.

163. The peptide or polypeptide of claim 154 wherein the CDR2 and CDR1 regions of a cassette of consecutive amino acids selected from the group consisting of SEQ ID NOs:30-113 or a fragment thereof are replaced by SEQ ID NOs:115 and 114, respectively.

164. The peptide or polypeptide of claim 154, wherein the CDR2 and CDR1 regions of a cassette of consecutive amino acids selected from the group consisting of SEQ ID NOs:30-32, 35, 37-39, 41, 43, 45, 46, 48, 51, 54, 57, 59-68, 70, 71, 76-85, 87, 89-92, 94, 97, 99, 103, 106, 112, and 113 or a fragment thereof are replaced by SEQ ID NOs:115 and 114, respectively.

165. The peptide or polypeptide of claim 138 wherein

the second and third hypervariable regions are a CDR2 and a CDR1 hypervariable region, respectively,

the CDR3 amino acid sequence is SEQ ID NO: 8,

the CDR2 amino acid sequence is SEQ ID NO: 115,

the CDR1 amino acid sequence is SEQ ID NO: 114,

the upstream region flanking the CDR3 region has the amino acid sequence of SEQ ID NO: 117,

the downstream region flanking the CDR3 region has the amino acid sequence of SEQ ID NO: 116,

the upstream region flanking the CDR2 region has the amino acid sequence of SEQ ID NO: 119,

the downstream region flanking the CDR2 region has the amino acid sequence of SEQ ID NO: 118,

the upstream region flanking the CDR1 region has the amino acid sequence of SEQ ID NO: 121, and

the downstream region flanking the CDR1 region has the amino acid sequence of SEQ ID NO: 120.

166. The peptide or polypeptide of claim 138 wherein

the second and third hypervariable regions are a CDR2 and a CDR1 hypervariable region, respectively,

the CDR3 amino acid sequence is SEQ ID NO: 20,

the CDR2 amino acid sequence is SEQ ID NO: 115,

the CDR1 amino acid sequence is SEQ ID NO: 114,

the upstream region flanking the CDR3 region has the amino acid sequence of SEQ ID NO: 117,

the downstream region flanking the CDR3 region has the amino acid sequence of SEQ ID NO: 116,

the upstream region flanking the CDR2 region has the amino acid sequence of SEQ ID NO: 119,

the downstream region flanking the CDR2 region has the amino acid sequence of SEQ ID NO: 118,

the upstream region flanking the CDR1 region has the amino acid sequence of SEQ ID NO: 121, and

the downstream region flanking the CDR1 region has the amino acid sequence of SEQ ID NO: 120.

167. The peptide or polypeptide of claim 137, wherein the Fv is an scFv obtainable from a phage display library.

168. The peptide or polypeptide of claim 164, wherein the phage display library was constructed from peripheral blood lymphocytes of a non-immunized human, and wherein the scFv peptide is selected against previously uncharacterized and unpurified antigens on the surface of a target cell.

169. A method for selecting or identifying the peptide or polypeptide of claim 164 comprising biopanning, wherein the biopanning comprises binding phage to a target, removing non-bound phage, eluting bound phage, and propagating and amplifying eluted phage.

170. A peptide or polypeptide comprising an Fv molecule, a construct thereof, a fragment of either, or a construct of a fragment, having enhanced binding characteristics so as to bind selectively and/or specifically to a substantially exposed and/or over-expressed binding site on or in a target cell, wherein the binding to the target cell occurs in favor of other cells on or in which the binding site is not substantially available and/or expressed, wherein the binding selectivity or specificity is primarily determined by a first hypervariable region, wherein the first hypervariable region is a CDR3 region consisting of SEQ ID Nos: 8 or 20, wherein the Fv is a scFv or a dsFv, and wherein the FV optionally has one or more tags.

171. The peptide or polypeptide of claim 170, wherein the binding selectivity or specificity is secondarily influenced by a second hypervariable region, by a third hypervariable region, and/or by one or more upstream or downstream region flanking the first, the second and/or the third hypervariable regions, and wherein the second and third hypervariable regions are a CDR2 and a CDR1 region, respectively.

172. A peptide or polypeptide comprising an Fv molecule, a construct thereof, a fragment of either, or a construct of a fragment having enhanced binding characteristics so as to bind selectively and/or specifically to a target cell in favor of other cells, wherein the Fv molecule comprises a first chain having a first, a second and a third hypervariable region and a second chain having a first, a second and a third hypervariable region, wherein one of the hypervariable regions of the first chain comprises a sequence of SEQ ID NOs:8 or20, and wherein one of the hypervariable regions of the second chain has a sequence selected from the group consisting of SEQ ID NOs:1-6 and 125-202, and wherein the first, second and third hypervariable regions are a CDR3, CDR2 and CDR1 region, respectively, wherein the Fv is a scFv or a dsFv, and wherein the FV optionally has one or more tags.

173. The peptide or polypeptide of claim 172 wherein

the first hypervariable region of the first chain and the first hypervariable region of the second chain are identical and are selected from the group consisting of SEQ ID NOs:8 or 20; or

(b) the first hypervariable region of the first chain is selected from the group consisting of SEQ ID NOs:8 or 20, and the first hypervariable region of the second chain is selected from the group consisting of SEQ ID NOs:1-6 and 125-202; or

the first hypervariable region of the first chain is selected from the group consisting of SEQ ID NOs:1-6 and 125-202, and the first hypervariable region of the second chain is selected from the group consisting of SEQ ID NOs:8 or 20.

174. The peptide or polypeptide of claim 172, wherein the second and third hypervariable regions of the first chain are SEQ ID NOs:114 and 115, respectively.

175. A peptide or polypeptide comprising an Fv molecule, a construct thereof, a fragment of either or a construct of a fragment that (a) binds to an unknown ligand on a first cell having a first and a second state, wherein the binding is effective in the second state but is not substantially effective in the first state, and, (b) by virtue of immuno-cross-reactivity, binds specifically or selectively to a ligand on a second cell, and wherein the Fv is a scFv or a dsFv, and wherein the Fv optionally has one or more tags, and wherein the first hypervariable region is a CDR3 region having an amino acid sequence selected from the group consisting of SEQ ID NOs 8 or 20.

176. The peptide or polypeptide of claim 175, wherein the first cell is a normal cell.

177. The peptide or polypeptide of claim 175, wherein the first state is a non-activated state and the second state is an activated, excited, modified, changed or disturbed state.

178. The peptide or polypeptide of claim 175, wherein the second cell is a diseased cell.

179. The peptide or polypeptide of claim 178, wherein the diseased cell is a cancer cell.

180. The peptide or polypeptide of claim 178 wherein the diseased cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma cells.

181. The peptide or polypeptide of claim 180, wherein the diseased cell is a leukemia cell.

182. The peptide or polypeptide of claim 181, wherein the leukemia cell is an acute myeloid leukemia cell.

183. The peptide or polypeptide of claim 175, wherein the selective and/or specific binding of the peptide or polypeptide to the ligand of the second cell is determined primarily by a first hypervariable region.

184. The peptide or polypeptide of claim 175, wherein the binding selectivity or specificity is secondarily influenced by a second hypervariable region, by a third hypervariable region, and/or by one or more of the upstream or

downstream region flanking the first, the second, and the third hypervariable regions, respectively.

185. A ligand that is expressed by the second cell and that is capable of being bound by the peptide or polypeptide of claim 175.

186. A molecule that recognizes and binds the ligand of claim 185.

187. A nucleic acid molecule encoding the peptide or polypeptide according to any one of claims 137, 170, 172 or 175.

188. The nucleic acid molecule of claim 187, wherein the nucleic acid is DNA.

189. The peptide or polypeptide of claim 175 wherein the first and second states of the first cell are the same, and wherein the first cell is derived from a cell line.

190. The peptide or polypeptide of claim 189, wherein the cell line is selected from the group consisting of Jurkat, Molt-4, HS-602, U937, TF-1, THP-1, KG-1, and HUT-78.

191. The pharmaceutical composition comprising one of the peptide or polypeptide of claim 137 or claim 175, in association with or attached to, coupled to, combined to, linked to, or fused to a pharmaceutical agent.

192. The composition of claim 191, wherein the composition has activity against a diseased cell.

193. The composition of claim 56 wherein the diseased cell is a cancer cell.

194. The composition of claim 192, wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma.

195. The composition of claim 194 wherein the cell is a leukemia cell.

196. The composition of claim 195, wherein the leukemia cell is an acute myeloid leukemia cell.

197. The peptide or polypeptide of claim 137 or claim 175, optionally in association with or attached, coupled, combined, linked or fused to a pharmaceutical agent, for use as a medicament.

198. The peptide or polypeptide of claim 197 wherein the medicament has activity against a diseased cell.

199. The peptide or polypeptide of claim 198 wherein the diseased cell is a cancer cell.

200. The peptide or polypeptide of claim 198, wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma cells.

201. The peptide or polypeptide of claim 200 wherein the cell is a leukemia cell.

202. The peptide or polypeptide of claim 201, wherein the leukemia cell is an acute myeloid leukemia cell.

203. The peptide or polypeptide of claim 137 or claim 175, wherein the peptide or polypeptide is utilized for preparing a composition for use in inhibiting the growth of a diseased cell.

204. The peptide or polypeptide of claim 203, wherein the cell is a leukemia cell.

205. The peptide or polypeptide of claim 204 wherein the leukemia cell is an acute myeloid leukemia cell.

206. A method of inhibiting the growth of a cancer cell comprising administering a composition comprising the peptide or polypeptide of claim 137 or claim 175, said composition comprising at least one compound having a pharmaceutical ligand selective and/or specific for the cancer cell.

207. A composition comprising at least one peptide of claim 137 or claim 175, in association with, or attached, coupled, combined, linked, or fused to a pharmaceutical agent in a pharmaceutically effective amount and, optionally, a pharmaceutically effective carrier.

208. The composition of claim 207 wherein the peptide or polypeptide and the pharmaceutical agent are linked via a linker compound.

209. The composition of claim 208, wherein the linker compound is selected from the group consisting of a dicarboxylic acid, a maleimido hydrazide, PDPH, a carboxylic acid hydrazide, and a small peptide.

210. The composition of claim 209, wherein the small peptide is selected from a group consisting of AU1, AU5, BTag, c-myc, FLAG, Glu-Glu, HA, His6, HSV, HTTPHH, IRS, KT3, Protein C, S•Tag®, T7, V5, and VSV-G.

211. The peptide or polypeptide according to any one of claims 137, 170, 172 and 175 wherein the tag is selected from a group consisting of: AU1, AU5, BTag, c-myc, FLAG, Glu-Glu, HA, His6, HSV, HTTPHH, IRS, KT3, Protein C, S•Tag®, T7, V5, and VSV-G.

212. The composition of claim 207, wherein the pharmaceutical agent is selected from the group consisting of radioisotope, toxin, oligonucleotide, recombinant protein, antibody fragment, and anti-cancer agent.

213. The composition of claim 212 wherein the radioisotope is selected from a group consisting of indiurn, ^{111}indium, ^{113}indium, ^{99m}rhenium, ^{105}rhenium, ^{101}rhenium, ^{99m}technetium, ^{121m}tellurium, ^{122m}tellurium, ^{125m}telluriunm ^{165}thulium, ^{167}thulium ^{168}thulium ^{123}iodine, ^{126}iodine, ^{131}iodine, ^{133}iodine, ^{81m}krypton, ^{33}xenon, ^{90}yttrium, ^{213}bismuth, ^{77}bromine, ^{18}fluorine, ^{95}ruthenium, ^{97}ruthenium, ^{103}ruthenium, ^{105}ruthenium, ^{107}mercury, ^{203}mercury, ^{67}gallium and ^{68}gallium.

214. The composition of claim 212, wherein the toxin is selected from the group consisting of gelonin, Pseudomonas exotoxin (PE), PE40, PE38, ricin, and modifications and derivatives thereof.

215. The composition of claim 212, wherein the anti-cancer agent is selected from the group consisting of doxorubicin, adriamycin, cis-platinum, taxol, calicheamicin, vincristine, cytarabine (Ara-C), cyclophosphazdde, prednisone, daunorubicin, idarubicin, fludarabine, chlorambucil, interferon alpha, hydroxyurea, temozolomide, thalidomide, bleomycin, and derivatives thereof.

216. A method of inhibiting the growth of a cell which comprises contacting the cell with an amount of the peptide or polypeptide of claim 137 or claim 175.

217. The method of claim 216 wherein the cell is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma.

218. The method of claim 217, wherein the cell is a leukemia cell.

219. The method of claim 218, wherein the leukemia cell is an acute myeloid leukemia cell.

220. A pharmaceutical composition comprising at least one peptide of claim 137 or claim 175 attached, coupled, combined, linked ,or fused to an imaging agent, wherein said composition is used in the diagnostic localization and imaging of a tumor.

221. A method of treating a patient suffering from a disease, which comprises administering to the patient an amount of the peptide or polypeptide of claim 137 or claim 175 effective to treat the disease.

222. The method of claim 221 wherein the disease is selected from the group consisting of carcinoma, sarcoma, leukemia, adenoma, lymphoma, myeloma, blastoma, seminoma, and melanoma.

223. The method of claim 222 wherein the disease is a leukemia.

224. The method of claim 223, wherein the leukemia is an acute myeloid leukemia.

225. The peptide or polypeptide of claim 137 or claim 175 wherein the Fv specifically or selectively binds to acute myeloid leukemia (AML) cells.

226. A ligand presented on AML cells bound by the peptide or polypeptide of claim 225.

227. A peptide or polypeptide that binds the ligand of claim 226.

228. A diagnostic kit for in vitro analysis of treatment efficacy before, during, or after treatment, comprising the peptide or polypeptide of claim 137 or claim 175 attached, coupled, combined, linked or fused to an indicative marker molecule.

229. The kit of claim 228 wherein the indicative marker molecule is a fluorescent marker.

230. The kit of claim 229, wherein the fluorescent marker is selected from the group consisting of fluorescein, rhodamine, phycoerythrin, and modifications and conjugates thereof.

231. The kit of claim 228 wherein the kit is used for diagnosis of cancer.

232. The peptide or polypeptide of claim 137 or claim 175, wherein the construct is an Ig polypeptide.

233. A method for producing the peptide or polypeptide of claim 232, wherein the Ig polypeptide is expressed as a recombinant polypeptide and is produced in a eukaryotic cell system.

234. The method of claim 233 wherein the eukaryotic system is a mammalian cell system.

235. The peptide or polypeptide of claim 232, wherein the Ig polypeptide is an IgG polypeptide.

236. The peptide or polypeptide of claim 235, wherein the IgG polypeptide comprises a CDR3, CDR2 and a CDR1 region having SEQ ID NOs:8, 115 and 114, respectively.

237. The peptide or polypeptide of claim 235, wherein the IgG polypeptide comprises a CDR3, CDR2 and a CDR1 region having SEQ ID Nos: 20, 115 and 114, respectively.

238. The IgG polypeptide of claim 236, wherein the CDR3, CDR2 and CDR1 regions are of the heavy chain.

239. The IgG polypeptide of claim 237, wherein the CDR3, CDR2 and CDR1 regions are of the heavy chain.

240. The IgG polypeptide of claim 236, wherein the CDR3, CDR2 and CDR1 regions are of the light chain.

241. The IgG polypeptide of claim 237, wherein the CDR3, CDR2 and CDR1 regions are of the light chain.

242. The IgG polypeptide of claim 232, wherein the IgG has a heavy chain comprising SEQ ID NO:26 and a light chain comprising SEQ ID NO:27 or chains having at least 90% amino acid similarity therewith.

243. A method for producing the peptide or polypeptide of claim 137 or claim 175 wherein the peptide or polypeptide is produced in a prokaryotic cell system or in a eukaryotic cell system.

244. The method of claim 243, wherein the prokaryotic system comprises *E. coli*, said *E. coli* comprising an expression vector and the eukaryotic system is a mammalian cell system.

245. The method of claim 244, wherein the expression vector of the prokaryotic system comprises a promoter selected from the group consisting of *osmB*, deo, β-lac-U5, λP_L and CMV.

246. The peptide or polypeptide of any of claims 137 or claim 172, wherein the CDR3 comprises the amino acid sequence of R_1-X Phe Pro-R_2, wherein R_1 and R_2 each comprises 0- 15 amino acid residues, and wherein X is either Arg, Gly, or Lys.

247. The peptide or polypeptide of claim 137 or claim 175, wherein said peptide or polypeptide includes at least one non-naturally occurring modification.

248. The peptide or polypeptide of claim 247, wherein said non-naturally occurring modification renders the peptide or polypeptide more immunogenic or more stable.

249. The peptide or polypeptide of claim 248, wherein said at least one modification is selected from the group consisting of peptoid modification, semipeptoid modification, cyclic peptide modification, N-terminus modification, C terminus modification, peptide bond modification, backbone modification, and residue modification.

250. The peptide or polypeptide of any of claims 137, 170, 172, 175 or 197, for *ex vivo* purging of autologous bone marrow to remove abnormal cells.